In the Specification

On page 1, kindly replace the first paragraph with the following:

TECHNICAL FIELD

~~The present invention~~This disclosure relates to improvements on white film for a reflecting structure for surface light source. More precisely, the ~~invention~~disclosure relates to a structure of white film which is used in reflecting sheets and reflectors for edge light-type and direct back light-type, surface light sources for liquid crystal display screens, and of which the brightness decreases little when used for a long time.

Kindly replace the paragraph spanning pages 1 and 2 with the following:

BACKGROUND ~~ART~~

For lighting units for liquid crystal display screens, widely used is an edge light system in which a cold cathode-ray tube serving as the source of light is disposed at the edge of a light guide plate (JP-A 62104/1988). In the lighting system of the type, a reflector is disposed around the cold cathode-ray tube for increasing the lighting efficiency therein, and a reflecting sheet is disposed below the light guide plate for efficiently reflecting the light having been diffused through the light guide plate toward a liquid crystal display screen. In the system, these have the function of reducing the loss of light from the cold cathode-ray tube and increasing the brightness of the liquid crystal display screen. However, the edge light system could not increase the brightness of recent wide screens of liquid crystal TVs, for which, therefore, a direct back light system is being employed. In the direct back light system, cold cathode-ray tubes are aligned in parallel below a liquid crystal display screen, and they are above a reflecting sheet in parallel with each other. The reflecting sheet may be flat or may be semi-circularly shaped to partly cover each cold cathode-ray tube.

On page 3, kindly replace the first and second full paragraphs with the following:

~~The present invention is to solve the problems noted above, and its object is~~It could therefore be advantageous to provide a reflecting structure for surface light source of which the brightness ~~lowers~~decreases little with time even when used for a long time and which ensures high-quality images for a long times.

~~DISCLOSURE OF THE INVENTION~~SUMMARY

~~To solve the problems as above, the subject matter of the invention resides in~~We provide a white film for surface light source reflecting structures, which contains voids inside it and has a light stabilizer-containing coating film formed on at least one surface of it.

Kindly replace the paragraph spanning pages 4 and 5 with the following:

~~BEST MODES OF CARRYING OUT THE INVENTION~~DETAILED DESCRIPTION

The white film ~~of the invention~~ is not specifically defined so far as it is apparently white, including, for example, thermoplastic films with any of organic or inorganic dye or fine particles added thereto; films formed by mixing a film-forming resin component and a resin not miscible with it, and/or organic or inorganic particles, melt-kneading the resulting mixture, and stretching it at least in one direction to thereby make the film have fine voids therein; foam films formed through melt extrusion with foaming particles added thereto; and foam films formed through foaming extrusion with a vapor such as carbon dioxide introduced thereinto. ~~Especially for the use of the invention, preferred~~Preferred are films formed by mixing a film-forming resin component and a resin not miscible with it, and/or organic or inorganic particles, melt-kneading the resulting mixture, and stretching it at least in one direction to thereby make the film have fine voids therein, as their reflectivity is higher and their brightness is higher. More preferred are composite films formed through coextrusion of laminating an organic or inorganic fine particles-containing thermoplastic

resin film on at least one surface of a film that contains fine voids therein, followed by stretching the laminate film to thereby make it have finer voids in the surface layer than in the inside thereof.

On page 6, kindly replace the first full paragraph with the following:

These polyesters may contain various additives such as heat-resistant stabilizer, antioxidant stabilizer, organic lubricant, organic and inorganic fine particles, light-proofing agent, antistatic agent, nucleating agent and coupling agent, not interfering with the desired effects ~~of the invention~~.

Kindly replace the paragraph spanning pages 6 and 7 with the following:

One preferred ~~embodiment of the invention~~aspect is described below, in which polyester is used as the white film base material. To whiten the polyester film for example, employable are a method of adding thereto various types of white dye or pigment; and a method of forming fine voids inside it as in the above. For attaining better results in the invention, preferred is the method of forming fine voids inside the film. For forming such fine voids inside it, for example, employable are (1) a method of adding a foaming agent to the resin to thereby make the resin film foamed by heat in the step of extrusion or film processing or foamed through chemical decomposition; (2) a method of adding a vapor such as carbon dioxide or a vaporizable substance to the resin during or after its extrusion to thereby make the resin film foamed; (3) a method of adding a thermoplastic resin not miscible with polyester to the resin, melt-extruding the resin mixture, and monoaxially or biaxially stretching the resin film; and (4) a method of adding organic or inorganic fine particles to the resin, melt-extruding the mixture, and monoaxially or biaxially stretching the resin film. ~~In the invention, the~~The fine voids formed in the film are to increase the reflective interface therein, for which, therefore, preferred is the method (3) or (4).

Kindly replace the paragraph spanning pages 7 and 8 with the following:

The size of the voids formed in the methods as above (this is the size of the cross section of the voids cut in the direction of the thickness of the film) preferably falls between 0.5 μm^2 and 50 μm^2, more preferably between 1 μm^2 and 30 μm^2, in view of the increased brightness of the film. The cross-sectional profile of the voids may be circular or oval. Preferably, the film is so constituted that at least one void exists everywhere in its vertical direction running from the top face to the back face thereof. When the film is formed into a reflecting sheet, the light from a light source enters it through the film surface, and it is the best that all the incident light having reached the reflecting sheet is entirely reflected by the voids inside the film. In fact, some light will pass through the film, and it shall be a light loss. To compensate[[it]], the surface of the film opposite [[to]]of the surface thereof that receives light (facing the light source) is preferably coated with metal such as aluminum or silver through vapor deposition. In addition, for reducing the light loss through the fine voids-containing polyester film, it is also desirable that the surface of the film is coated with a layer that contains fine voids formed by organic or inorganic fine particles. The surface layer may be formed by co-extruding a polyester resin that contains organic or inorganic fine particles, along with the resin for the fine voids-containing film, followed by stretching the resulting composite film at least in one direction. Preferably, the voids in the surface layer are smaller than those in the inner layer of the composite film for increasing the brightness of the film. The ratio (void size in surface layer/void size in inner layer) is not specifically defined, but preferably falls between 0.05 and 0.8, more preferably between 0.07 and 0.7, most preferably between 0.1 and 0.6. The void size can be controlled by controlling the size of the particles to be added to film-forming resins.

Kindly replace the paragraph spanning pages 8 and 9 with the following:

Now described hereinunder are resins not miscible with polyester resin, and the organic or inorganic particles to be added to the surface layer and the inner layer, which are to form voids in polyester films. The resin not miscible with polyester film (hereinafter referred to as "immiscible resin") is a thermoplastic resin except polyester, and this can disperse in polyester, forming particles therein. Preferred examples of the resin of the type are polyolefin resins such as polyethylene, polypropylene, polybutene, polymethylpentene; as well as polystyrene resins, polyacrylate resins, polycarbonate resins, polyacrylonitrile resins, polyphenylene sulfide resins, and fluororesins. These may be homopolymers or copolymers, and two or more different types of these may be combined for use herein. Especially preferred are resins that yield a great critical surface tension difference from polyester and hardly deform in heat treatment after stretching. For these, preferred are polyolefin resins, and more preferred is polymethylpentene. The content of the immiscible resin to be in the white film is not specifically defined, and may be suitably determined so that the film is not broken while formed and the brightness of the film can be increased by the voids formed from the nuclei of the immiscible resin in the film. In general, it falls preferably between 3 and 35% by weight, more preferably between 4 and 30% by weight, most preferably between 5 and 25% by weight. If the content is smaller than 3% by weight, the brightness of the film could not increase so much; but if larger than 35% by weight, the film may be broken while formed.

Kindly replace the paragraph spanning pages 11 and 12 with the following:

The reflecting structure for surface light source is a tabular structure that is combined with a surface light source for light reflection thereon, as so mentioned hereinabove. Concretely, it includes reflecting sheets for edge lights-type surface light sources for liquid crystal display screens, reflecting sheets for direct back light-type surface light sources, and reflectors around cold cathode-ray tubes.

For the reflecting structure for surface light source of the type, the degree of whiteness of the reflecting sheet is preferably higher for bettering the color tone of screens, and bluish reflecting sheets are preferred to yellowing ones. Take this into consideration, it is desirable to add a fluorescent brightener to the white film. The fluorescent brightener may be any commercially-available one, including, for example, Uvitex (by Ciba-Geigy), OB-1 (by Eastman), TBO (by Sumitomo Seika), Keikol (by Nippon Soda), Kayalite (by Nippon Kayaku), and Leucopoor EGM (by Clariant Japan). Preferably, the content of the fluorescent brightener in the white film falls between 0.005 and 1% by weight, more preferably between 0.007 and 0.7% by weight, most preferably between 0.01 and 0.5% by weight. If its content is smaller than 0.005% by weight, the fluorescent brightener may be ineffective; but if larger than 1% by weight, it is unfavorable since too much fluorescent brightener rather yellows the white film. In the case where the white film is a composite film, the fluorescent brightener is more preferably added to the surface layer of the film.

On page 12, kindly replace the first full paragraph with the following:

~~In the invention, at~~At least one surface of the white film must be coated with a light stabilizer-containing coating layer. The light stabilizer may be any of organic light stabilizers of, for example, hindered amines, salicylates, benzophenones, benzotriazoles, cyanoacrylates, triazines, benzoates, oxalic anilides; and inorganic light stabilizers of, for example, sol-gel compounds. Preferred examples of the light stabilizer ~~for use in the invention~~ are mentioned below. Needless-to-say, these are not limitative.

On page 14, kindly replace the first full paragraph with the following:

Of the examples mentioned above, at least any of hindered amines, benzophenones and benzotriazoles are preferred ~~for use in the invention~~, more preferably, these are combined for use herein.

Kindly replace the paragraph spanning pages 14 and 15 with the following:

~~In the invention, the~~The light stabilizer to be in the coating layer is preferably mixed with any other resin component for facilitating the formation of the coating layer. Specifically, one preferred ~~embodiment for it~~aspect comprises dissolving or dispersing the resin component and the light stabilizer in an organic solvent capable of dissolving the resin component and the light stabilizer, or in water, a mixture of two or more different types of organic solvents, or a mixture of organic solvent/water to prepare a solution or dispersion that serves as the coating liquid for the layer. Needless-to-say, the resin component and the light stabilizer may be separately dissolved or dispersed in such an organic solvent, water, an organic solvent mixture or a mixture of organic solvent/water , and the resulting solutions or dispersions may be mixed in any desired ratio to be the coating liquid. Also preferred is preparing a copolymer of the light stabilizer component and the resin component followed by directly using the copolymer for the coating material. Needless-to-say, the copolymer may be dissolved in an organic solvent, water, a mixture of two or more different types of organic solvent, or a mixture of organic solvent/water to prepare a solution for the coating liquid. The resin component to be mixed or copolymerized with the light stabilizer is not specifically defined. Its examples are polyester resins, polyurethane resins, acrylic resins, methacrylic resins, polyamide resins, polyethylene resins, polypropylene resins, polyvinyl chloride resins, polyvinylidene chloride resins, polystyrene resins, polyvinyl acetate resins, and fluororesins. These resins may be used either singly or as combined to be a copolymer or mixture of two or more of them.

Kindly replace the paragraph spanning pages 19 and 20 with the following:

The light stabilizer-containing coating layer may be formed on the white film in any desired manner. For it, for example, employable is any method of gravure coating, roll coating, spin coating, reverse coating, bar coating, screen coating, blade coating, air knife coating or dipping. In the case

where the coating layer is cured, after ~~formed~~formation, employable is any known curing method. For example, the coating layer may be cured through exposure to heat or to active rays such as UV rays, electron rays or radiations, or exposure to any of these combinations. In curing it, a curing agent such as a crosslinking agent is preferably used. For forming the coating layer, employable is any of an in-line coating process in which the white film is coated with the coating layer in the line where it is formed, or an off-line coating process in which the substrate is, after separately prepared and processed for crystal orientation therein in a film-forming line, coated with the coating layer in a different coating line.

On page 20, kindly replace the first full paragraph with the following:

Preferably, the white film ~~of the invention~~ has a mean reflectance of at least 85%, more preferably at least 87%, even more preferably at least 90%, when measured on the light stabilizer-containing coating layer thereof exposed to light having a wavelength of from 400 to 700 nm. If the mean reflectance of the white film is smaller than 85%, the screen brightness of some liquid crystal displays comprising the white film may be low, depending on the type of the displays.

Kindly replace the paragraph spanning pages 20 and 21 with the following:

Also preferably, the white film ~~of the invention~~ has a degree of glossiness of at most 60%, more preferably at most 50%, most preferably at most 40%, when measured on the light stabilizer-containing coating layer thereof. If the glossiness of the white film is larger than 60%, the screen brightness of some liquid crystal displays comprising the white film may be low, depending on the viewing angle to the screen.

On page 21, kindly replace the first full paragraph with the following:

~~In the invention, the~~The light stabilizer-containing coating layer may contain various additives not interfering with the effect ~~of the invention~~. The additives are, for example, organic

and/or inorganic fine particles, fluorescent brightener, crosslinking agent, heat-resistant stabilizer, antioxidant stabilizer, organic lubricant, antistatic agent, nucleating agent, and coupling agent.

Kindly replace the paragraph spanning pages 22 and 23 with the following:

Preferably, the thickness of the white film ~~in the invention~~ falls between 10 and 500 μm, more preferably between 20 and 300 μm. If the thickness thereof is smaller than 10 μm, the reflectivity, the whiteness and the appearance of the white film may not reach the practical level, and the white film may be difficult to handle. On the other hand, if thicker than 500 μm, the white film may be too heavy and may be therefore unsuitable for a reflecting structure for surface light sources to be in liquid crystal displays[[,]] and, in addition, its cost may increase. In a case where the white film is a composite film, the ratio of surface layer/inner layer thereof preferably falls between 1/30 and 1/3, more preferably between 1/20 and 1/4. In a case where the composite film has a three-layered structure of surface layer/inner layer/surface layer, the ratio shall be represented by the total of the two surface layers/inner layer.

On page 23, kindly replace the first full paragraph with the following:

One ~~embodiment~~example of producing the white film for a reflecting structure for surface light sources ~~of the invention~~ is described below, to which, however, the ~~invention~~example is not ~~limited~~limiting.

On page 27, kindly replace the second full paragraph with the following:

EXAMPLES

The ~~invention is~~films are described with reference to the following Examples and Comparative Examples, to which, however, the ~~invention is~~films are not limited.

On page 33, kindly replace the paragraph with the following:

INDUSTRIAL APPLICABILITY

Exposed to a light source, the white film for a reflecting structure for surface light sources ~~of the invention~~ is aged little with time. When built in liquid crystal displays, it ensures good image quality and brightness of the display screens for a long time. Therefore, the white film ~~of the invention~~ is favorable to reflecting sheets and reflectors in edge light-type and direct back light-type surface light sources for liquid crystal display screens.